DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

(Artificial Intelligence and Machine Learning)

III YEAR I-SEMESTER

S.No	Course Code	Course Title	Category	L	T	P	C
1	21AM3111	Machine Learning	PC	3	-	-	3
2	21AM3112	Software Engineering	PC	3	-	-	3
3	21AM3113	Artificial Intelligence	PC	3	-	-	3
4	**Open Elective – I**			3	-	-	3
5	**Professional Elective – I**			3	-	-	3
	21DS3171	Automata & Compiler Design	PE				
	21AM3172	Computer Networks	PE				
	21DS3172	Computer Graphics	PE				
	21CS3174	Distributed Systems	PE				
PRACTICAL							
6	21AM3151	Artificial Intelligence &Machine Learning Lab	PC	-	-	3	1.5
7	21AM3152	Software Engineering Lab	PC	-	-	3	1.5
8	21HS3153	Advanced English Communication Skills Lab	HS	-	-	2	1
9	21MC0006	Aptitude and Logical Reasoning	MC	3	-	-	0
10	21AM3181	Summer Internship	PW	-	-	-	1
Total Credits			**24**	**15**	**-**	**8**	**20**

***Note:** Summer Internship to be carried out during summer break after 2nd yr 2nd semester.

III YEAR II- SEMESTER

S.No	Course Code	Course Title	Category	L	T	P	C
1	21AM3211	Neural Networks & Deep Learning	PC	3	-	-	3
2	21AM3212	Natural Language Processing	PC	3	-	-	3
3	21DS3212	Web Technologies	PC	3	-	-	3
4	**Open Elective – II**			3	-	-	3
5	**Professional Elective – II**			3	-	-	3
	21IT3271	Cloud Computing	PE				
	21AM3272	Image Processing	PE				
	21AM3273	Data Visualization	PE				
	21CS3274	Distributed Databases	PE				
PRACTICAL							
6	21AM3251	Neural Networks & Deep Learning Lab	PC	-	-	3	1.5
7	21AM3252	Natural Language Processing Lab	PC	-	-	3	1.5
8	21AM3253	Web Technologies Lab	PC	-	-	3	1.5
9	21MC0007	Yoga and Indian Philosophy	MC	2	-	-	0
Total			**25**	**17**	**-**	**9**	**19.5**

21AM3111: MACHINE LEARNING

B.Tech III Year I Sem. **L T P C**
3 - - 3

Prerequisites:

1. Statistics
2. Linear Algebra
3. Calculus
4. Probability
5. Programming Languages and data structures.

Course Objectives: The course will explain

- The basic theory underlying machine learning.
- Machine learning problems corresponding to different applications.
- A range of machine learning algorithms along with their strengths and weaknesses.
- Machine learning algorithms to solve problems of moderate complexity.
- The algorithms to a real-world problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models..

Course Outcomes: At the end of the course, the student will be able to

1. Appreciate the importance of visualization in the data analytics solution.
2. Apply structured thinking to unstructured problems.
3. Understand a very broad collection of machine learning algorithms and problems.
4. Learn algorithmic topics of machine learning and mathematically deep enough to introduce the required theory.
5. Develop an appreciation for what is involved in learning from data**.**

UNIT-I

Introduction - Well-posed learning problems, designing a learning system, Perspectives and issues in machine learning

Concept learning and the general to specific ordering – introduction, a concept learning task, concept learning as search, find-S: finding a maximally specific hypothesis, version spaces and the candidate elimination algorithm, remarks on version spaces and candidate elimination, inductive bias, Gradient Descent Algorithm and its variants.

UNIT–II

Supervised Learning- Regression: Linear-Simple, Multiple, Logistic Regression.

Classification- Naive Bayes Classifier, k-NN classifier, Support Vector Machines -Linear, Non Linear

Ensemble Techniques I-Decision Trees-ID3(Iterative Dichotomiser3), CART(Classification and Regression Tree)

UNIT–III

Ensemble Techniques II- C4.5, CHAID (Chi-Square Automatic Interaction Detection),Random Forest Algorithm.

Unsupervised Learning-Clustering: Measures of distance, k-means, Gaussian Mixture Model Clustering, Hierarchical Learning- Divisive, Agglomerative Clustering

UNIT-IV

Artificial Neural Networks-1– Introduction, neural network representation, appropriate problems for neural network learning, perceptions, multilayer networks and the back-propagation algorithm.

Artificial Neural Networks-2- Remarks on the Back-Propagation algorithm, An illustrative example: face recognition, advanced topics in artificial neural networks.

UNIT-V

Genetic Algorithms – Motivation, Genetic algorithms, an illustrative example, hypothesis space search, genetic programming, models of evolution and learning, parallelizing genetic algorithms.

Reinforcement Learning–Introduction, the learning task, *Q*–learning, non-deterministic, rewards and actions, temporal difference learning, generalizing from examples, relationship to dynamic programming.

TEXT BOOKS:

1. Machine Learning –Tom M. Mitchell,-MGH,2020.
2. Introduction to Machine Learning with Python, Andreas C. Müller, Sarah Guido, First Edition, O'Reilly Media, Inc, 2016.

REFERENCE BOOKS:

1. Machine Learning: An Algorithmic Perspective, Stephen Marshland, Taylor & Francis.
2. Mathematics for Machine learning, – Marc Peter Deisenroth, First Edition,– Cambridge University Press.

21AM3112: SOFTWARE ENGINEERING

B.Tech. III Year I Sem. **L T P C**
3 - - 3

Prerequisites:

- Computer Programming
- Database Management Systems

Course Objectives

- To understand fundamental principles of Software engineering, and their application in the development of software products.
- To understand and create the software requirements specifications document.
- To understand and use unified modeling language for specifying, analysis and designing.
- To understand testing strategies for testing software applications
- To understand Software metrics and Risk Management strategies to identify potential problems before they occur.

Course Outcomes

- Able to apply the software engineering lifecycle phases communication, planning, analysis, design, construction, and deployment.
- Ability to translate end-user requirements into system and software requirements into Software Requirements specification Document (SRS)
- Able to apply UML in object-oriented software modeling to develop computer software.
- Able to identify problems in software and will be able to develop a simple testing report.
- To understand Software Metrics, potential risk and how to manage them though RMMM plan.

UNIT - I

Introduction: The evolving role of software, Changing Nature of Software, legacy software, Software myths.

A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models, COCOMO Model.

Process Models: The waterfall model, Incremental process models, Evolutionary process models, specialized process models, The Unified process.

UNIT - II

Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

Requirements Engineering Process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management, Software requirements documents

System models: Context Models, Behavioral models, Data models, Object models, structured methods.

UNIT - III

Modeling Techniques using UML: The Unified Approach to Modeling, Structural and Behavioral Diagrams.

Design Engineering: Data Flow Diagrams, Design process and Design quality, Design concepts, the design model, pattern-based software design.

Creating an architectural design: Architectural styles and patterns, Architectural Design, assessing alternative architectural designs.

UNIT - IV

Implementation: Structured coding Techniques, Coding Styles-Standards and Guidelines.

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Regression Testing, Unit Testing, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

Quality Management: Quality concepts, software quality assurance, software reviews, statistical software quality assurance, software reliability, the ISO 9000 quality standards.

UNIT - V

Product metrics: Software quality, metrics for analysis model, metrics for design model, metrics for source code, metrics for testing, metrics for maintenance.

Risk management: Reactive Vs proactive risk strategies, software risks, risk identification, risk projection, risk refinement, RMMM, RMMM plan.

TEXT BOOKS:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition, McGraw Hill International Edition, 2009.
2. Software Engineering- Sommerville, 7th edition, Pearson Education, 2017.
3. The unified modeling language user guide Grady Booch, James Rambaugh, Ivar Jacobson, Pearson Education, 1998.

REFERENCE BOOKS:

1. "Software Engineering", Ian Sommerville, Addison-Wesley, 9th Edition, 2010, ISBN- 13: 978-0137035151.
2. Richard Fairley, "Software Engineering Concepts", Tata McGraw Hill.
3. Fundamentals of object-oriented design using UML Meiler page-Jones: Pearson Education.
4. Software testing techniques by Boris Beizer, dreamtech.
5. Software Engineering, an Engineering approach- James F. Peters, WitoldPedrycz, John Wiley.
6. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies.

21AM3113: ARTIFICIAL INTELLIGENCE

B.Tech III Year I Sem. **L T P C**
3 - - 3

COURSE OBJECTIVES:

Develop ability to

1. Understand the difference between various intelligent agents and environments including solving problems by searching the solution space.
2. Understand adversarial search and propositional logic to find the solutions of constraint satisfaction problems.
3. Reference using first order logic and describe knowledge representation
4. Design solutions to a problem in the real world environment
5. Learn to infer in uncertain domains using probabilistic learning models.

COURSE OUTCOMES:

Differentiate various intelligent agents and environments.

1. Also solve problems by searching the solution space.
2. Use adversarial search and propositional logic to solve constraint satisfaction problems
3. Use first order logic to infer and describe knowledge representation
4. Plan solutions for problems in the real world environment.
5. Infer in uncertain domains using probabilistic learning models

UNIT - I:

Problem Solving by Search-I & II Introduction to AI, Intelligent Agents, Problem-Solving Agents, Searching for Solutions, Uninformed Search Strategies: Breadth-first search, Uniform cost search, Depth-first search, Iterative deepening Depth-first search, Bidirectional search, Informed (Heuristic) Search Strategies: Greedy best-first search, A* search, Heuristic Functions, Beyond Classical Search: Hill-climbing search, Simulated annealing search.

UNIT – II

Adversarial Search: Games, Optimal Decisions in Games, Alpha–Beta Pruning, Imperfect Real-Time Decisions. Constraint Satisfaction Problems: Defining Constraint Satisfaction Problems, Constraint Propagation, Backtracking Search for CSPs, Local Search for CSPs, the Structure of Problems. Propositional Logic: Knowledge-Based Agents, The Wumpus World, Logic, Propositional Logic, Propositional Theorem Proving: Inference and proofs, Proof by resolution, Horn clauses and definite clauses, Forward and backward chaining, Effective Propositional Model Checking, Agents Based on Propositional Logic

UNIT - III:

Logic and Knowledge Representation First-Order Logic: Representation, Syntax and Semantics of First-Order Logic, Using First-Order Logic, Knowledge Engineering in First-Order Logic. Inference in First-Order Logic: Propositional vs. First-Order Inference, Unification and Lifting, Forward Chaining, Backward Chaining, Resolution. Knowledge Representation: Ontological Engineering, Categories and Objects, Events. Mental Events and Mental Objects, Reasoning Systems for Categories, Reasoning with Default Information.

UNIT - IV:

Planning Classical Planning: Definition of Classical Planning, Algorithms for Planning with State-Space Search, Planning Graphs, other Classical Planning Approaches, and Analysis of Planning approaches. Planning and Acting in the Real World: Time, Schedules, and Resources, Hierarchical Planning, Planning and Acting in Nondeterministic Domains, Multi agent planning,

UNIT - V:

Approaches to Uncertain Reasoning; Dempster-Shafer theory. Learning: Forms of Learning, Knowledge in Learning: Logical Formulation of Learning, the Semantics of Bayesian Networks.

TEXT BOOK:

1. Artificial Intelligence a Modern Approach, Stuart Russell and Peter Norvig, 4th Edition, Pearson Education, 2020.

REFERENCE BOOKS:

1. Artificial Intelligence, E.Rich and K.Knight, , 3rd Edition, TMH, 2009.
2. Artificial Intelligence, Patrick Henny Winston, 3rd Edition, Pearson Education, 2015.
3. Artificial Intelligence, Shivani Goel, Pearson Education, 2013. .
4. Artificial Intelligence and Expert systems – Patterson, Pearson Education, 2005

21DS3171: AUTOMATA & COMPILER DESIGN

(Professional Elective - I)

B.Tech. III Year I Sem. **L T P C**

3 - - 3

COURSE OBJECTIVES:

1. To get familiar with regular expressions to describe a language using automata.
2. Usage of context free grammars to describe the syntax of a language
3. To learn different parsing techniques
4. To provide techniques for syntactic, semantic language analysis, intermediate code Generation and optimization
5. Emphasize the concepts learnt in lexical analysis, syntax analysis, semantic analysis, intermediate code generation and type checking process through several programming exercises

COURSE OUTCOMES:

1. Read and write finite automata and grammars for programming language constructs.
2. Understand the functionality of parsing mechanisms.
3. Construct syntax trees and generate intermediate code.
4. Understand the concepts of storage administration for different programming environments
5. Understand the concepts of optimization and generate the machine code

UNIT - I

Formal Language And Regular Expressions : Languages, Operations On Languages, Regular Expressions, Identity Rules For Regular Expressions, Finite Automata – DFA, NFA, Conversion Of Regular Expression to NFA, NFA To DFA. Introduction to Compilers: Phases of the Compiler.

UNIT- II

Syntax Analysis: Context Free Grammars, Top-Down Parsing, Recursive Descent Parsers: LL (K) Parsers. Bottom-Up Parsing: Shift Reduces Parser, LR Parsers: SLR, CLR, and LALR.

UNIT- III

Syntax Directed Translation: Syntax Directed Definition, Construction of Syntax Trees, L-Attributed Definitions. Intermediate Code Generation: Intermediate Languages, Translation of Assignment Statements and Boolean Expressions.

UNIT- IV

Type Checking: Specification of Simple Type Checker, Equivalence of Type Expressions, Type Conversions Runtime Environments: Storage Organization, Storage Allocation Strategies, Access to Non Local Names, Parameter Passing, Symbol Table, Dynamics Storage Allocation Techniques.

UNIT- V

Code Optimization: Principal Sources Of Optimization, Optimization Of Basic Blocks, Loops In Flow Graphs, Global Data Flow Analysis, Peephole Optimization. Code Generation: Issues in Design of Code Generator, Simple Code Generator, Register Allocation and Assignment, DAG Representation of Basic Block, Generating Code from DAGs.

Text Books:

1. Compilers Principles, Techniques and Tools, Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman, PEA.
2. Introduction to Automata Theory Languages & Computation, 3 rd Edition, Hopcroft, Ullman, PEA .

Reference Books:

1. Theory of Computer Science, Automata Languages and Computation, 2nd Edition, Mishra, Chandra Shekaran, PHI.
2. Elements of Compiler Design, A.Meduna, Auerbach Publications, Taylor and Francis Group.

21AM3172: COMPUTER NETWORKS

(Professional Elective - I)

B.Tech. III Year I Sem. **L T P C**
3 - - 3

Prerequisites
- A course on "Programming for problem solving"
- A course on "Data Structures"

Course Objectives
- The objective of the course is to equip the students with a general overview of the concepts and fundamentals of computer networks.
- Familiarize the students with the standard models for the layered approach to communication between machines in a network and the protocols of the various layers.

Course Outcomes
- Gain the knowledge of the basic computer network technology.
- Gain the knowledge of the functions of each layer in the OSI and TCP/IP reference model.
- Obtain the skills of sub netting and routing mechanisms.
- Familiarity with the essential protocols of computer networks, and how they can be applied in network design and implementation.
- Gain Knowledge of E-Mail Protocols, Streaming Audio and Video on Web.

UNIT – I
Network hardware, Network software, OSI, TCP/IP Reference models, Example Networks: ARPANET, Internet.
Physical Layer: Guided Transmission media: twisted pairs, coaxial cable, fiber optics, Wireless transmission.

UNIT – II
Data link layer: Design issues, framing, Error detection and correction.
Elementary data link protocols: simplex protocol, A simplex stop and wait protocol for an error-free channel, A simplex stop and wait protocol for noisy channel.
Sliding Window protocols: A one-bit sliding window protocol, A protocol using Go-Back-N, A protocol using Selective Repeat, Example data link protocols.
Medium Access sub layer: The channel allocation problem, Multiple access protocols: ALOHA, Carrier sense multiple access protocols, collision free protocols. Wireless LANs, Data link layer switching.

UNIT – III
Network Layer: Design issues, Routing algorithms: shortest path routing, Flooding, Hierarchical routing, Broadcast, Multicast, distance vector routing, Congestion Control Algorithms, Quality of Service, Internetworking, the Network layer in the internet.

UNIT – IV

Transport Layer: Transport Services, Elements of Transport protocols, Congestion Control, Connection management, TCP and UDP protocols.

UNIT – V

Application Layer –Domain name system, SNMP, Electronic Mail; the World WEB, HTTP, Streaming audio and video.

TEXT BOOK:

1. Computer Networks - Andrew S Tanenbaum, David. j. Wetherall, 5th Edition. Pearson Education/PHI,2000 or later.

REFERENCES:

1. An Engineering Approach to Computer Networks-S. Keshav, 2 nd Edition, Pearson Education.
2. 2. Data Communications and Networking – Behrouz A. Forouzan. Third Edition TMH.

21DS3172: COMPUTER GRAPHICS

(Professional Elective–I)

B.Tech III Year I Sem. **L T P C**

3 - - 3

Prerequisites:

1. Familiarity with the theory and use of coordinate geometry and of linear algebra such as matrix multiplication.
2. A course on "Computer Programming and Data Structures"

Course Objectives:

- The aim of this course is to provide an introduction of fundamental concepts and theory of computer graphics.
- Topics covered include graphics systems and input devices, geometric representations and 2D/3D transformations, viewing and projections, illumination and color models, animation, rendering and implementation, visible surface detection;

Course Outcomes:

- Acquire familiarity with the relevant mathematics of computer graphics.
- Be able to design basic graphics application programs,including animation
- Be able to design applications that display graphic images to given specifications.

UNIT-I

Introduction: Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices

Output primitives: Points and lines, line drawing algorithms (Bresenham's and DDA Algorithm), mid-point circle and ellipse algorithms

Polygon Filling: Scan-linealgorithm,boundary-fill and flood-fill algorithms

UNIT-II

2-D geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems

2-Dviewing: The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland algorithms, Sutherland – Hodgeman polygon clipping algorithm.

UNIT-III

3-D object representation: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods.

UNIT-IV

3-D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations.

Viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping

UNIT-V

Computer animation: Design of animation sequence,general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications

Visible surface detection methods: Classification, back-face detection, depth-buffer, BSP-tree methods and area sub-division methods

TEXTBOOKS:

1. "Computer Graphics *C version*", Donald Hearn and M.Pauline Baker,Pearson Education, 2014.
2. "Computer Graphics Principles & practice",second edition in C,Foley,Van Dam,Feiner and Hughes, Pearson Education, 2013.
3. Computer Graphics,Steven Harrington,TMH, 1983.

REFERENCE BOOKS:

1. Procedural elements for Computer Graphics,David F Rogers,Tata McGraw hill,2nd edition.
2. Principles of Interactive Computer Graphics",Neuman and Sproul,TMH.
3. Principles of Computer Graphics, Shalini Govil, Pai, 2005,Springer.

21CS3174: DISTRIBUTED SYSTEMS

(Professional Elective - I)

B.Tech. III Year I Sem. **L T P C**
3 - - 3

COURSE OBJECTIVES

1. To understand the foundations of distributed systems.
2. To learn issues related to clock Synchronization and the need for global state in distributed systems.
3. To understand the significance of agreement, fault tolerance and recovery protocols in Distributed Systems.
4. To introduce the concepts of distributed file systems, shared memory and message passing systems, synchronization and resource management.
5. To introduce the concepts of Transactions and Concurrency Control and Distributed deadlocks

COURSE OUTCOMES:

1. Distinguish distributed computing paradigm from other computing paradigms.
2. Able to explain various distributed algorithms, such as logical clocks and leader election.
3. Illustrate the mechanisms of inter process communication in distributed system.
4. Explain name services and distributed shared memory.
5. The students will be able to define, explain and illustrate fundamental principles of concurrent transaction processing.

UNIT I

Characterization of Distributed Systems: Introduction, Examples of Distributed systems,Resource sharing and web, challenges.

System Models: Introduction, Architectural and Fundamental models.

UNIT II

Time and Global States: Introduction, Clocks, Events and Process states, synchronizingphysical clocks, Logical time and Logical clocks, Global states, Distributed Debugging.

Coordination and Agreement: Introduction, Distributed mutual exclusion, Elections, Multicast Communication, Consensus and Related problems.

UNIT III

Inter Process Communication: Introduction, The API for the internet protocols, External Data Representation and Marshalling, Client-Server Communication, Group Communication, Case Study: IPC in UNIX.

Distributed Objects and Remote Invocation: Introduction, Communication between Distributed Objects, Remote Procedure Call, Events and Notifications, Case study-Java RMI.

UNIT IV

Distributed File Systems: Introduction, File service Architecture, Case Study1: Sun Network File System, Case Study 2: The Andrew File System. Name Services: Introduction, Name Services and the Domain Name System, Directory Services, Case study of the Global Name Service.

Distributed Shared Memory: Introduction Design and Implementation issues, Sequential consistency and Ivy case study, Release consistency and Munin case study, other consistency models.

UNIT V

Transactions and Concurrency Control: Introduction, Transactions, Nested Transactions, Locks, Optimistic concurrency control, Timestamp ordering, Comparison of methods for Concurrency control.

Distributed Transactions: Introduction, Flat and Nested Distributed Transactions, Atomic commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery

TEXT BOOK:

1. Distributed Systems, Concepts and Design, George Coulouris, J Dollimore and Tlm Kind berg, Pearson Education, 4h Edition, 2009.

REFERENCE BOOKS:

1. Distributed Systems, Principles and paradigms, Andrew S.Tanenbaum, Maarten Van
2. Steen, Second Edition, PHI.
3. Distributed Systems, An Algorithm Approach, Sikumar Ghosh, Chapman & Hall/CRC,
4. Taylor & Fransis Group, 2007.
5. Distributed Systems, Principles and Paradigms, Andrew S.Tanenbaum, Maarten Van Steen, 2d Edition, Phl.
6. Distributed Systems, An Algorithm Approach, Sukumar Ghosh,Chapman&HalyCRC, Taylor & Fransis Group, 2007.

21AM3151: ARTIFICIAL INTELLIGENCE & MACHINE LEARNING LAB

B.Tech. III Year I Sem.

L	T	P	C
-	-	3	1.5

Course Objective: The objective of this lab is to get an overview of the various machine learning techniques and can able to demonstrate those using python.

Course Outcomes: After the completion of the course the student can able to:

- Understand complexity of Machine Learning algorithms and their limitations;
- Understand modern notions in data analysis-oriented computing;
- Be capable of confidently applying common Machine Learning algorithms in practice and implementing their own;
- Be capable of performing experiments in Machine Learning using real-world data.

List of Experiments

1. Implement linear regression using python.
2. Implement logistic regression using python.
3. Implement Naïve Bayes Classifier using python
4. Implement k-nearest neighbours classifier using python
5. Implement Support Vector Machine classifier using python
6. Implement K Means clustering using python
7. ImplementthefinitewordsclassificationsystemusingBack-propagationalgorithm
8. Implementation of A* search
9. Implementation of Heuristic search
10. Implementation of BFS, DFS search
11. Implementation of simple ChatGPT.
12. Implementation of Water jug problem

Note: Implement the above experiments using suitable datasets from kaggle

21AM3152: SOFTWARE ENGINEERING LAB

B.Tech III Year I Sem. **L T P C**

- - 3 1.5

Course Objectives

1. To have hands on experience in developing a software project by using various software principles and methods in each of the phases of software development.
2. To provide the idea of decomposing the given problem into Analysis, Design, Implementation, Testing and Maintenance phases.
3. To provide an idea of using various process models in the software industry according to given circumstances.
4. To gain the knowledge of how Analysis, Design, Implementation, Testing and Maintenance processes are conducted in a software project.
5. To help students to develop skills that will enable them to construct software of high quality – software that is reliable, and that is reasonably easy to understand, modify and maintain

Course Outcomes
Students will be able:

1. To translate end-user requirements into system and software requirements specification document.
2. To create data flow diagrams.
3. To create software application design using UML Diagrams
4. To decompose the given project in various phases of a life cycle
5. To apply the knowledge, techniques, and skills in the development of a software product.

UNIFIED MODELLING LAB Tools:

1. Use Smart Draw for data flow diagrams
2. Rational Rose or Star UML for UML diagrams

LIST OF EXPERIMENTS:

Do the following exercises for projects given in the list of sample projects

1. Development of problem statement.
2. Preparation of Software Requirement Specification Document, Design Documents and Testing Phase related documents.
3. Draw level0, level1, and level2 data flow diagrams
4. Study and usage of any Design phase CASE tool
5. Performing the Design by using any Design phase CASE tools.
6. Performing functional testing and create simple testing report

SAMPLE PROJECTS:

1. Hospital management system
2. Online mobile recharge portal
3. Online Exam Registration
4. Stock Maintenance System
5. E-ticketing for Travel system
6. Credit Card Processing
7. E-book management System.
8. Online Recruitment system

21HS3153: ADVANCED ENGLISH COMMUNICATION SKILLS LAB

B.Tech. III Year I Sem. **L T P C**
- - 2 1

Introduction
A course on Advanced English Communication Skills (AECS) Lab is considered essential at the third year level of B.Tech and Pharmacy courses. At this stage, the students need to prepare themselves for their career which requires them to listen to, read, speak and write in English both for their professional and interpersonal communication. The main purpose of this course is to prepare the students of Engineering for their placements.

Course Objectives
This Lab focuses on using multi-media instruction for language development to meet the following targets:

- To improve students' fluency in spoken English
- To enable them to listen to English spoken at normal conversational speed
- To help students develop their vocabulary
- To read and comprehend texts in different contexts
- To communicate their ideas relevantly and coherently in writing
- To make students industry-ready
- To help students acquire behavioural skills for their personal and professional life
- To respond appropriately in different socio-cultural and professional contexts

Course Outcomes
Students will be able to:

- Acquire vocabulary and use it contextually
- Listen and speak effectively
- Develop proficiency in academic reading and writing
- Increase possibilities of job prospects
- Communicate confidently in formal and informal contexts

Unit-I

Inter-personal Communication and Building Vocabulary –Starting a Conversation–Responding Appropriately and Relevantly –Using Appropriate Body Language –Role Play in Different Situations – Synonyms and Antonyms, One-word Substitutes, Prefixes and Suffixes, Idioms and Phrases and Collocations.

Unit-II

Reading Comprehension –General Vs Local Comprehension, Reading for Facts, Guessing Meanings from Context, , Skimming, Scanning, Inferring Meaning.

Unit-III

Writing Skills –Structure and Presentation of Different Types of Writing –Letter Writing/Resume Writing/ e-correspondence/ Technical Report Writing.

Unit-IV

Presentation Skills –Oral Presentations (individual or group) through JAM Sessions/Seminars/PPTs and Written Presentations through Posters/Projects/Reports/ emails/Assignments…etc.

Unit-V

Group Discussion and Interview Skills –Dynamics of Group Discussion, Intervention, Summarizing, Modulation of Voice, Body Language, Relevance, Fluency and Organization of Ideas and Rubrics of Evaluation-Concept and Process, Pre-interview Planning, Opening Strategies, Answering Strategies, Interview through Tele-conference & Video-conference and Mock Interviews.

REFERENCE BOOKS:

1. Kumar, Sanjay and Pushp Lata. English for Effective Communication, Oxford University Press, 2015.
2. Konar, Nira. English Language Laboratories –A Comprehensive Manual, PHI Learning Pvt. Ltd., 2011

21MC0006: Aptitude and Logical Reasoning

B.Tech. III Year I Sem. **L T P C**

Course Code: 21MC0006 3 - - 0

Course Objectives:

1.Student learns the techniques to solve all the problems in his real life.
2.It can improve the numerical ability.
3.The quicker methods are useful to solve the problems within the time and it is helpful in his duties.
4.Quantative Aptitude helps in solving the practical life problems.
5.Students can use Quantitative Aptitude in everyday life to figure out mathematically.
6.Student can improve his mental capacity.
7.It helps in sharpening their minds.

UNIT I

Number System, Percentages, Profit And Loss, Simple Interest - Compound Interest, Partnership Ratio And Proportion ,Chain Rule, Time And Work - Pipes And Cistern, Time And Distance - Problems On Trains, Boats And Streams, Races And Games Of Skill

UNIT II

Average, Alligation And Mixture, Permutation-Combination, Probability, Geometry (Co-Ordinate, Solid-2d Areas & 3d Volumes), D I (Tabulation, Bar Graphs, Pie Charts & Line Graphs), Elementary Statistics

UNIT III:

Series Completion, Analogy, Classification / Odd One Out, Coding – Decoding, Blood Relations, Deciphering Jumbled up Descriptions,

UNIT IV:

Relation Puzzle, Direction sense test, Number, Ranking & Time Sequence Test, Puzzle Test, Seating Arrangements Comparison Type Questions, Sequential Order of Things, Selection Based on gave conditions,

UNIT V

Family – Based Puzzles, Jumbled Problems. Logical Venn Diagrams
Alpha Numeric Sequence Puzzle, Cubes, Dice, Clocks, Calendar, Data Sufficiency, Syllogism.

TEXT BOOKS:

1. Quantitative Aptitude by R.S.Agarwal
2. Quantitative Aptitude by Abhijit Guha
3. Quantitative Aptitude for Competative Examinations, U.Mohan Rao, Scitech Publication.

21AM3181: Summer Internship

B.Tech. III Year I Sem.

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21AM3211: NEURAL NETWORKS & DEEP LEARNING

B.Tech. III Year II Sem. **L T P C**
3 - - 3

Prerequisites:

1. Discrete Mathematical Structures
2. Mathematical and Statistical Foundations
3. Python Programming
4. Machine Learning

Course Objectives: The main objective of this course is to make students comfortable with:

1. Tools and techniques required in handling large amounts of datasets
2. Various deep learning methods in Neural Networks.
3. Several libraries and datasets publicly available will be used to illustrate the application of these algorithms.
4. Developing skills required to gain experience of doing independent research and study.
5. Gaining the knowledge to apply Regularization and optimization strategies

Course Outcomes: At the end of the course student will be able to:

1. Understand, Apply, Analyze and Evaluate Supervised Learning Neural Networks on different datasets
2. Understand, Apply, Analyze and Evaluate UnSupevised Learning Neural Networks on different datasets
3. Understand, Apply, Analyze and Evaluate Deep Neural Networks on image
4. Understand, Apply, Analyze and Evaluate Regularization techniques on deep learning networks
5. Understand, Apply, Analyze and Evaluate Optimization techniques on deep learning net

UNIT-I

Artificial Neural Networks Introduction, Basic models of ANN, important terminologies, Supervised Learning Networks, Perceptron Networks, Adaptive Linear Neuron, Back-propagation Network. Associative Memory Networks. Training Algorithms for pattern association, BAM and Hopfield Networks.

UNIT-II

Unsupervised Learning Network- Introduction, Fixed Weight Competitive Nets, Maxnet, Hamming Network, Kohonen Self-Organizing Feature Maps, Learning Vector Quantization, Counter Propagation Networks, Adaptive Resonance Theory Networks. Special Networks-Introduction to various networks.

UNIT-III

Deep Feedforward Networks: Learning XOR, Gradient-Based Learning, Hidden Units, Architecture Design, Back-Propagation and Other Differentiation Algorithms

UNIT-IV

Regularization for Deep Learning: Parameter norm Penalties, Norm Penalties as Constrained Optimization, Regularization and Under-Constrained Problems, Dataset Augmentation, Noise Robustness, Semi-Supervised learning, Multi-task learning, Early Stopping, Parameter Typing and Parameter Sharing, Sparse Representations, Bagging and other Ensemble Methods, Dropout, Adversarial Training, Tangent Distance, tangent Prop and Manifold, Tangent Classifier

UNIT-V

Optimization for Train Deep Models: Challenges in Neural Network Optimization, Basic Algorithms, Parameter Initialization Strategies, Algorithms with Adaptive Learning Rates, Approximate Second-Order Methods, Optimization Strategies and Meta-Algorithms

Applications: Large-Scale Deep Learning, Computer Vision, Speech Recognition, Natural Language Processing

TEXT BOOKS:

1. Deep Learning: An MIT Press Book By Ian Good fellow and Yoshua Bengio and Aaron Courville
2. Neural Networks and Learning Machines, Simon Haykin, 3rd Edition, Pearson Prentice Hall.

REFERENCE BOOKS:

1. Neural Networks and Deep Learning by Charu C. Aggarwal, 2018
Deep Learning- Ian Good Fellow, Yoshua Bengio. Aaron Courville

21AM3212: NATURAL LANGUAGE PROCESSING

B.Tech III Year II Sem. **L T P C**

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Prerequisites:

1. Data structures, finite automata and probability theory.
2. Knowledge on basics of Machine Learning.

Course Objectives:

1. Introduce to some of the problems and solutions of NLP and their relation to linguistics and statistics.
2. Introduce to NLP problems and solutions relation to linguistics and statistics.
3. Introduce to Regular expression and probabilistic model with n-grams.
4. Introduce to Recognizing Speech and parsing with grammar.
5. To learn basis of semantic analysis and discourse analysis.

Course Outcomes:

1. Show sensitivity to linguistic phenomena and an ability to model them with formal grammars.
2. Understand and carry out proper experimental methodology for training and evaluating empirical NLP systems
3. Able to manipulate probabilities, construct statistical models over strings and trees, and estimate parameters using supervised and unsupervised training methods.
4. Able to design, implement, and analyze NLP algorithms
5. Able to design different language modeling Techniques.

UNIT-I

Finding the Structure of Words: Words and Their Components, Issues and Challenges, Morphological Models

Finding the Structure of Documents: Introduction, Methods, Complexity of the Approaches, Performances of the Approaches

UNIT-II

Syntax Analysis: Parsing Natural Language, Tree banks: A Data-Driven Approach to Syntax, Representation of Syntactic Structure, Parsing Algorithms, Models for Ambiguity Resolution in Parsing, Multilingual Issues

UNIT-III

Semantic Parsing : Introduction, Semantic Interpretation, System Paradigms, Word Sense Systems, Software.

UNIT-IV

Predicate- Argument Structure, Meaning Representation Systems, Software.

UNIT-V

Discourse Processing: Cohension, Reference Resolution, Discourse Cohension and Structure

Language Modeling: Introduction, N-Gram Models, Language Model Evaluation, Parameter Estimation, Language Model Adaptation, Types of Language Models, Language-Specific Modeling Problems, Multilingual and Cross lingual Language Modeling

TEXTBOOKS:

1. MultilingualnaturalLanguageProcessingApplications:FromTheorytoPractice–Daniel M. Bikel and Imed Zitouni, Pearson Publication, 2012.
2. Natural Language Processing and Information Retrieval: Tanvier Siddiqui,U.S.Tiwar, 2008.

REFERENCEBOOKS:

1. Speech and Natural Language Processing- Daniel Jurafsky & James H Martin, Pearson Publications
2. Foundations of Statistical Natural Language Processing by Christopher D.Manning and Hinrich Schuetze, MIT press, 1999

21DS3212: WEB TECHNOLOGIES

B.Tech. III Year II Sem. **L T P C**
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Course Objectives

- To introduce Client-side scripting with Java script and AJAX.
- To introduce PHP language for server-side scripting
- To introduce XML and processing of XML Data with Java
- To introduce Server-side programming with Java Servlets
- To introduce Server-side Programming with JSP

Course Outcomes

- Understand basics of HTML and CSS and Design and Development of Dynamic Web Pages (using Validations) with Java Script and AJAX programming
- Understand Server-side Scripting with PHP language.
- Analyse what is XML and how to parse and use XML data with JAVA
- Develop Server side Application with Servlets (Sessions and Cookies).
- Create JSP pages with Database Server**.**

UNIT-I: HTML Common tags- List, Tables, images, forms, Frames; Cascading Style sheets;
Client-side Scripting: Introduction to JavaScript, JavaScript language – declaring variables, scope of variables, functions, event handlers (onclick, on submit etc.), Document Object Model, Form validation.

UNIT-II: XML: XML: Introduction to XML, XML document structure, DTD, Namespaces and XML Schemas.
Web Application Frameworks: Introduction toAngularJS, ReactJS,NodeJS ,JQuery.
Web Robot*:* Eg: WayBack Machine, PGF (http://sites.google.com/view/pgovernanceforum) Cyberpolicing Case Study of CFGoT-FGoI

UNIT - III: Introduction to Servlets: Common Gateway Interface (CGI), Life cycle of a Servlet, deploying a servlet, The Servlet API, Reading Servlet parameters, Reading Initialization parameters, Handling Http Request & Responses, Session tracking, Cookies and Sessions, connecting to a database using JDBC.

UNIT-IV: Introduction to JSP: The Anatomy of a JSP Page, JSP Processing, Declarations, Directives, Expressions, Code Snippets, implicit objects, Using Beans in JSP Pages, Using Cookies and session for session tracking, connecting to database in JSP.

UNIT-V: Introduction to PHP: Declaring variables, data types, arrays, strings, operators, expressions, control structures, functions, Reading data from web form controls like text boxes, radio buttons, and lists etc., Handling File Uploads. Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies

File Handling in PHP: File operations like opening, closing, reading, writing, appending, deleting etc. on text and binary files, listing directories.

TEXT BOOKS:

1. Web Technologies, UttamK Roy, Oxford UniversityPress
2. The Complete Reference PHP — Steven Holzner, TataMcGraw-Hill

REFERENCES:

1. Web Programming, building internet applications, Chris Bates 2″ edition, WileyDreamtech
2. Java Server Pages —Hans Bergsten, SPDO'Reilly,
3. Java Script,D.Flanagan
4. Beginning Web Programming-Jon DuckettWROX.
5. Programming world wide web, R.W.Sebesta, Fourth Edition, Pearson.
6. Internet and World Wide Web — How to program. Dietel and Nieto,Pearson.
7. B. Malathi, K. Pavan Johar, N. Santhoshi, N. SrihariRao, K. Chandra Sekharaiah, "The Nuts and Bolts of the India-Abusive Fake Government of Telangana: Cyber policing Against Online Sedition", ICSCIS2020 Springer Procds. Pp.553-563.

21IT3271: CLOUD COMPUTING

(Professional Elective–II)

B.Tech. III Year II Sem. **L T P C**

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Course Objectives:

- This course provides an insight into cloud computing
- Topics covered include-distributed system models, different cloud service models, service-oriented architectures, cloud programming and software environments, resource management.

Course Outcomes:

- Ability to understand various service delivery models of a cloud computing architecture.
- Ability to understand the ways in which the cloud can be programmed and deployed.
- Understanding cloud service providers.

UNIT-I

Computing Paradigms: High-Performance Computing, Parallel Computing, Distributed Computing, Cluster Computing, Grid Computing, Cloud Computing, Bio computing, Mobile Computing, Quantum Computing, Optical Computing, Nano computing.

UNIT-II

Cloud Computing Fundamentals: Motivation for Cloud Computing, The Need for Cloud Computing, Defining Cloud Computing, Definition of Cloud computing, Cloud Computing Is a Service, Cloud Computing Is a Platform, Principles of Cloud computing, Five Essential Characteristics, Four Cloud Deployment Models

UNIT-III

Cloud Computing Architecture and Management: Cloud architecture, Layer, Anatomy of the Cloud, Network Connectivity in Cloud Computing, Applications, on the Cloud, Managing the Cloud, Managing the Cloud Infrastructure Managing the Cloud application, Migrating Application to Cloud, Phases of Cloud Migration Approaches for Cloud Migration.

UNIT-IV

Cloud Service Models: Infrastructure as a Service, Characteristics of IaaS. Suitability of IaaS, Prosand Cons of IaaS, Summary of IaaS Providers, Platform as a Service, Characteristics of PaaS, Suitability of PaaS, Pros and Cons of PaaS, Summary of PaaS Providers, Software as a Service, Characteristics of SaaS, Suitability of SaaS, Pros and Cons of SaaS, Summary of SaaS Providers, Other Cloud Service Models.

UNITV

Cloud Service Providers: EMC, EMC IT, Captiva Cloud Toolkit, Google, Cloud Platform, Cloud Storage, Google Cloud Connect, Google Cloud Print, Google App Engine, Amazon Web Services, Amazon Elastic Compute Cloud, Amazon Simple Storage Service, Amazon Simple Queue, service, Microsoft, indows Azure,Microsoft Assessment and Planning Tool kit, Share Point,IBM,Cloud Models, IBM Smart Cloud, SAP Labs, SAP HANA Cloud Platform, Virtualization Services Provided by SAP,Salesforce,SalesCloud,Service Cloud: Knowledge as a

Service,Rack space,VM ware,Manjra soft, Aneka Platform.

TEXTBOOK:

1. Essentials of cloud Computing:K. Chandrasekhran, CRC press,2014

REFERENCEBOOKS:

1. Cloud Computing:Principles and Paradigms by Rajkumar Buyya,James Broberg and Andrzej M.Goscinski,Wiley,2011.
2. Distributed and Cloud Computing, Kai Hwang,Geoffery C.Fox,Jack J.Dongarra, Elsevier,2012.
3. Cloud Security and Privacy:An Enterprise Perspective on Risks and Compliance,Tim Mather, Subra Kumara swamy, Shahed Latif,O'Reilly,SPD,rp2011.

21AM3272: IMAGE PROCESSING
(Professional Elective - I)

B.Tech. III Year II Sem.

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Course Objectives:

1. Understand the theoretical and mathematical foundations of Digital Image Processing.
2. Explain different image acquisition, sampling and quantization methods;
3. Perform Preprocessing and image enhancement operations on given images.
4. Apply different Image restoration, and segmentation techniques.
5. Perform different image compression techniques.

Course Outcomes:

1. Demonstrate the knowledge of the basic concepts of two-dimensional signal acquisition, sampling, and quantization.
2. Demonstrate the knowledge of filtering techniques.
3. Demonstrate the knowledge of 2D transformation techniques.
4. Demonstrate the knowledge of image enhancement, segmentation, restoration and compression techniques.

UNIT - I

Digital Image Fundamentals: Digital Image through Scanner, Digital Camera. Concept of Gray Levels. Gray Level to Binary Image Conversion. Sampling and Quantization. Relationship between Pixels. Imaging Geometry. 2D Transformations-DFT, DCT, KLT and SVD.

UNIT - II

Image Enhancement in Spatial Domain Point Processing, Histogram Processing, Spatial Filtering, Enhancement in Frequency Domain, Image Smoothing, Image Sharpening.

UNIT - III

Image Restoration Degradation Model, Algebraic Approach to Restoration, Inverse Filtering, Least Mean Square Filters, Constrained Least Squares Restoration, Interactive Restoration.

UNIT - IV

Image Segmentation Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region Oriented Segmentation.

UNIT - V

Image Compression Redundancies and their Removal Methods, Fidelity Criteria, Image Compression Models, Source Encoder and Decoder, Error Free Compression, Lossy Compression.

TEXT BOOK:

1. Digital Image Processing: R.C. Gonzalez & R. E. Woods, Addison Wesley/ Pearson Education,2nd Ed, 2004.
2. Fundamentals of Digital Image Processing: A. K. Jain ,PHI.

REFERENCE BOOKS:

1. Fundamentals of Digital Image Processing: A. K. Jain, PHI.
2. Digital Image Processing using MAT LAB: Rafael C. Gonzalez, Richard E. Woods,Steven L.Eddins: Pearson Education India, 2004.
3. Digital Image Processing: William K. Pratt, John Wilely, 3rd Edition, 2004.

21AM3273: DATA VISUALIZATION

(Professional Elective-II)

B.Tech. III Year II Sem. **L T PC**

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Course Objective:

1. To learn about different Visualization Techniques
2. To study the Interaction techniques in information visualization fields
3. To understand various abstraction mechanisms
4. To create interactive visual interfaces
5. To learn data modeling and data processing

Course Outcomes:

1. Visualize the objects in different dimensions.
2. Design and process the data for Virtualization.
3. Apply the visualization techniques in physical sciences, computer science, applied mathematics and medical science.
4. Apply core skills for visual analysis
5. Apply visualization techniques for various data analysis tasks

UNIT - I

Introduction and Data Foundation: Basics - Relationship between Visualization and Other Fields - The Visualization Process - Pseudo code Conventions - The Scatter plot. Data Foundation - Types of Data - Structure within and between Records - Data Preprocessing - Data Sets

UNIT - II

Foundations for Visualization: Visualization stages - Semiology of Graphical Symbols - The Eight Visual Variables - Historical Perspective - Taxonomies - Experimental Semiotics based on Perception Gibson‘s Affordance theory – A Model of Perceptual Processing.

UNIT - III

Visualization Techniques: Spatial Data: One-Dimensional Data - Two-Dimensional Data –Three-Dimensional Data - Dynamic Data - Combining Techniques.

Geospatial Data: Visualizing Spatial Data- Visualization of Point Data -Visualization of Line Data - Visualization of Area Data - Other Issues in Geospatial Data Visualization **Multivariate Data:** Point-Based Techniques - Line- Based Techniques - Region-Based Techniques - Combinations of Techniques – Trees Displaying Hierarchical Structures – Graphics and Networks- Displaying Arbitrary Graphs/Networks.

UNIT-IV

Interaction Concepts and Techniques: Text and Document Visualization: Introduction - Levels of Text Representations - The Vector Space Model - Single Document Visualizations

-Document Collection Visualizations - Extended Text Visualizations **Interaction Concepts**: Interaction Operators -Interaction Operands and Spaces - A Unified Framework. **Interaction Techniques**: Screen Space - Object-Space -Data Space -Attribute Space- Data Structure Space - Visualization Structure – Animating Transformations -Interaction Control

UNIT - V

Research Directions in Virtualizations: Steps in designing Visualizations – Problems in designing effective Visualizations- Issues of Data. Issues of Cognition, Perception, and Reasoning. Issues of System Design Evaluation, Hardware and Applications.

TEXT BOOKS:

1. Colin Ware "Information Visualization Perception for Design",3 rd edition, morgan Kaufman 2012. (UNIT 1)
2. Stuart.K.Card, Jock.D. Mackinlay and Ben Shneiderman, "Readings in information Visualization Using Vision to think", Morgan Kaufmann Publishers,1999. (UNIT 3).
3. Thomas Strothotte, "Computer Visualization–Graphics Abstraction and interactivity", Springer Verlag Berlin Heiderberg 1998. (UNIT 2,4,5)

REFERENCE BOOKS

1. Chaomei Chan, "Information Visualization",Beyond the horizon, 2nd edition, Springer Verlag,2004.
2. Pauline Wills, "Visualisation: A Beginner's Guide", Hodder and Stoughlon,1999.
3. Benedikt. M, "Cyberspace: Firot Steps",MIT Press, 1991.

21CS3274: DISTRIBUTED DATABASES

(Professional Elective - I)

B.Tech. III Year II Sem. **L T P C**

3 - - 3

Prerequisites

- A course on "Database Management Systems"

Course Objectives

- The purpose of the course is to enrich the previous knowledge of database systems and
- Exposing the need for distributed database technology to confront with the deficiencies of the centralized database systems. Introduce basic principles and implementation techniques of distributed database systems.
- Equip students with principles and knowledge of parallel and object-oriented databases.
- Topics include distributed DBMS architecture and design; query processing and optimization;
- Distributed transaction management and reliability; parallel and object database management systems.

Course Outcomes

- Understand theoretical and practical aspects of distributed database systems.
- Study and identify various issues related to the development of distributed database system.
- Understand the design aspects of object-oriented database system and related development.
- Able to Practice Parallel distributed databases.
- Identify the differences between OODBMS and ORDBMS.

UNIT - I

Introduction: Distributed Data Processing, Distributed Database System, Promises of DDBSs, Problem areas. Distributed DBMS Architecture: Architectural Models for Distributed DBMS, DDMBS Architecture.

Distributed Database Design: Alternative Design Strategies, Distribution Design issues, Fragmentation, Allocation.

UNIT - II

Query processing and decomposition: Query processing objectives, characterization of query processors, layers of query processing, query decomposition, localization of distributed data.

Distributed query Optimization: Query optimization, centralized query optimization, distributed query optimization algorithms.

UNIT - III

Transaction Management: Definition, properties of transaction, types of transactions.

Distributed Concurrency Control: serializability, concurrency control mechanisms & algorithms, time - stamped & optimistic concurrency control Algorithms, deadlock Management.

UNIT - IV

Distributed DBMS Reliability: Reliability concepts and measures, fault-tolerance in distributed systems, failures in Distributed DBMS, local & distributed reliability protocols, site failures and network partitioning.

Parallel Database Systems: Parallel database system architectures, parallel data placement, parallel query processing, load balancing, database clusters.

UNIT - V

Distributed object Database Management Systems: Fundamental object concepts and models, object distributed design, architectural issues, object management, distributed object storage, object query Processing.

Object Oriented Data Model: Inheritance, object identity, persistent programming languages, persistence of objects, comparison OODBMS and ORDBMS.

TEXT BOOKS:

1. M. Tamer OZSU and PatuckValduriez: Principles of Distributed Database Systems, Pearson Edn. Asia, 2001.
2. Stefano Ceri and Giuseppe Pelagatti: Distributed Databases, McGraw Hill.

REFERENCES:

1. Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer Widom: “Database Systems: The Complete Book”, Second Edition, Pearson International Edition
2. Chanda Ray (2012), Distributed Database Systems, 1st Edition, Pearson Education India.

21AM3251: NEURAL NETWORKS & DEEP LEARNING LAB

B.Tech. III Year II Sem. **L T P C**

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Course Objectives:

1. To Build the Foundation of Deep Learning.
2. To Understand How to Build the Neural Network.
3. To enable students to develop successful machine learning concepts.

Course Outcomes:

1. Upon the Successful Completion of the Course, the Students would be able to:
2. Learn the Fundamental Principles of Deep Learning.
3. Identify the Deep Learning Algorithms for Various Types of Learning Tasks in various domains.
4. Implement Deep Learning Algorithms and Solve Real-world problems.

LIST OF EXPERIMENTS:

1. Setting up the Spyder IDE Environment and Executing a Python Program
2. Installing Keras, Tensor flow and Pytorch libraries and making use of them
3. Applying the Convolution Neural Network on computer vision problems
4. Image classification on MNIST dataset (CNN model with Fully connected layer)
5. Applying the Deep Learning Models in the field of Natural Language Processing
6. Train a sentiment analysis model on IMDB dataset, use RNN layers with LSTM/GRU notes
7. Applying the Auto encoder algorithms for encoding the real-world data
8. Applying Generative Adversial Networks for image generation and un supervised tasks.

TEXTBOOKS:

1. Deep Learning by Ian Good fellow, Yoshua Bengio and Aaron Courville, MIT Press, 2016.
2. The Elements of Statistical Learning by T. Hastie, R.Tibshirani, and J.Friedman, Springer, 2017.
3. Probabilistic Graphical Models. Koller, and N.Friedman, MIT Press, 2009.

REFERENCE BOOKS:

1. Bishop, C.M., Pattern Recognition and Machine Learning, Springer,2006.
2. Yegnanarayana, B.,Artificial Neural Networks PHI Learning Pvt. Ltd,2009.
3. Golub, G.H., and VanLo an, C.F., Matrix Computations, JHUPress, 2013.
4. Satish Kumar, Neural Networks: A Classroom Approach, Tata Mc Graw Hill Education, 2004.

21AM3252: NATURAL LANGUAGE PROCESSING LAB

B.Tech. III Year II Sem. **L T P C**

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Prerequisites:

1. Knowledge on Programming languages, Data structures.
2. Knowledge on finite automata and probability theory .

Course Objectives:

1. Knowledge on basic Language processing features
2. Knowledge on design an innovative application using NLP components.

Course Outcomes:

1. Understand and carry out proper experimental methodology for training and evaluating empirical NLP systems
2. Able to design, implement, and analyze NLP algorithms.

List of Experiments

1. Word Analysis
2. Word Generation
3. Morphology
4. N-Grams
5. N-Grams Smoothing

TEXT BOOKS:

1. Artificial Intelligence: A Modern Approach Third Edition Stuart Russell and Peter Norvig, 2010.Pearson Education, Inc. ISBN: 978-0-13-604259-4
2. Daniel Jurafsky, James H. Martin—Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech, Pearson Publication, 2014.
3. Steven Bird, Ewan Klein and Edward Loper, —Natural Language Processing with Python, First Edition, O'Reilly Media, 2009.

REFERENCE BOOK:

1. Breck Baldwin, —Language Processing with Java and Ling Pipe Cookbook, AtlanticPublisher, 2015

21AM3253: WEB TECHNOLOGIES LAB

B.Tech. III Year II Sem.

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Course Objectives

- To enable the student to program web applications using the following technologies HTML, Java script , AJAX, PHP, Tomcat Server, Servlets ,JSP.

Course Outcomes

- USE LAMP / XAMP for Web Applications
- Simple Applications with Technologies like HTML, JavaScript and AJAX
- Design web application using PHP
- Parse XML Files using JAVA(DOM AND SAX Parsers)
- Use Tomcat Server for Servlets and connect to Database
- Develop JSP Applications using Tomcat Server and Java Bean development

List of Experiments

1. Write an HTML code to demonstrate
   a) Lists b) Tables (rowspan and colspan) c) Cascading Style Sheets
2. Design a web page to demonstrate
   a) Divisions b) Frames c) Embedding Images
3. Develop static pages (use Only HTML) of an online book store. The pages should resemble: www.amazon.com. The website should consist the following pages.
   a) Home page
   b) Registration and user Login
   c) User Profile Page
   d) Books catalog
   e) Shopping Cart
   f) Payment By credit card
   g) Order Conformation
4. Write an HTML page that contains a selection box with a list of 5 countries. When the user selects a country, its capital should be printed next to the list. Add CSS to customize the properties of the font of the capital (color, bold and font size).
5. a) Validate the Registration, user login, user profile and payment by credit card pages using JavaScript.
   b) Web Robot: Eg: WayBack Machine, PGF Cyber policing Case Study
6. Build an application on a) React JS b) Angular JS c) Node.js and JSON.
7. Write the following XML Programs
   a) Create a DTD document to validate the XML document.
   b) Create a XML Schema document to validate the XML document
8. Install the following on the local machine
   a) Apache Tomcat Web Server
   b) Install MySQL/Oracle (if not installed)
   c) Install PHP and configure it to work with Apache web server and MySQL

9. a) Write a Servlet program to read the parameters from user interface and display Welcome message.
   b) Write a Servlet program to read initialization parameters using ServletConfig and ServletContext object.
10. Write Servlet programs to work with the following session tracking techniques.
    a) Http Session b) Cookies c) Hidden form controls
11. Develop a dynamic web page which contains Registration and Login Forms using servlet with Oracle database .Validate the login page.
12. a) Write a JSP Program to handle the exceptions. b) Write a JSP Program to access bean information using useBean tag.
13. Develop a dynamic web page which contains Registration and Login Forms using JSP with Oracle database .Validate the login page.
14. Write a PHP script that reads data from one file and write into another file.
15. Develop a dynamic web page which contains Registration and Login Forms in PHP with MySQL database .Validate the login page.

TEXT BOOK:

1. WEB TECHNOLOGIES: A Computer Science Perspective, Jeffrey C. Jackson, Pearson Education

REFERENCE BOOKS:

1. Deitel H.M. and Deitel P.J., "Internet and World Wide Web How to program", Pearson International, 2012, 4th Edition.
2. J2EE: The complete Reference By James Keogh,McGraw-Hill
3. Bai and Ekedhi, The Web Warrior Guide to Web Programming,Thomson
4. Paul Dietel and Harvey Deitel," Java How to Program", Prentice Hall of India, 8th Edition

Web technologies, Black Book, Dreamtechpress.

21MC0007: YOGA AND INDIAN PHILOSOPHY

B.Tech. III Year II Sem **L T P C**

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UNIT-I

Bhagavad Gita, chapter 2 SankhyaYoga slokaspage nos.54-72 about emotional intelligence(Stitaprajnata)

UNIT-II

Bhagavad Gita, chapters 3-7

UNIT-III

Bhagavad Gita, chapters 8-11

UNIT-IV

Bhagavad Gita, chapters 12-15

UNIT-V

Bhagavad Gita, chapters 16-18

10 quotes from each chapter of ref.(2)

REFERENCE BOOKS:

1) Bhagavad Gita By Swami Swarupananda, RK Math Publication
2) Vivekananda-His Call to the Nation, R K Math Publication